

CLAIMS

- 1 1. A method for providing access over a network to data and services available
2 within a collaborative computer system in response to a request message from a
3 non-collaborative client, the request containing information identifying the non-
4 collaborative client and the method comprising:
 - 5 a) receiving the request message in a server connected to the non-
6 collaborative client, extracting from the request message the information
7 identifying the non-collaborative client and modifying the request message
8 by replacing the information identifying the non-collaborative client with
9 information identifying a queue in the server;
 - 10 b) sending the modified request message to a collaborative client in the
11 collaborative computer system via the network, wherein the collaborative
12 client provides a response message containing the data and services
13 requested;
 - 14 c) sending the response message to the server queue identified in the
15 modified request message, and
 - 16 d) using the information in the server identifying the non-collaborative client
17 to forward the response message from the server queue to the non-
18 collaborative client.
- 1 2. The method of claim 1 further comprising:
 - 2 (e) the collaborative client publishing a convenient name associated with
3 selected data and services available in the collaborative computer system
4 before step (a) is performed.
- 1 3. The method of claim 2 wherein the request message includes the convenient
2 name and step (a) comprises:
 - 3 (a1) extracting from the request message the convenient name; and

4 (a2) using the convenient name to retrieve information identifying the location
5 of the collaborative client that can provide the selected data and services.

1 4. The method of claim 1 wherein step (b) comprises:
2 (b1) sending the modified request message directly to the collaborative client
3 when the collaborative client is connected to the network; and
4 (b2) sending the modified request message to a relay server when the
5 collaborative client is not connected to the network.

1 5. The method of claim 4 wherein the server is part of the relay server that connects
2 the non-collaborative client to the network.

1 6. The method of claim 1 wherein the server waits on the server queue after step
2 (b) and wherein step (d) further comprises:
3 (d1) forwarding the response message from the server queue to the non-
4 collaborative client when the response message is received in the server
5 queue.

1 7. The method of claim 1 wherein the server does not wait for a response in step (b)
2 and wherein step (d) is performed in response to a method call by the non-
3 collaborative client.

1 8. The method of claim 7 wherein the request message contains a unique request
2 identifier and wherein the response message returns the unique request identifier
3 to the non-collaborative client and the non-collaborative client compares the
4 request identifier sent in the request message with the request identifier in the
5 response message to determine if the response is associated with the request.

1 9. The method of claim 1 further comprising:

- 2 (e) subscribing to an event service at the collaborative client indicating a
3 request for notification of selected actions in the collaborative system; and
4 (f) the collaborative client placing event messages in the server queue when
5 a selected action occurs.

1 10. The method of claim 1 wherein the request and the response messages have the
2 same protocol.

1 11. The method of claim 11 wherein the protocol is the Simple Object Access
2 Protocol.

1 12. Apparatus for providing access over a network to data and services available
2 within a collaborative computer system in response to a request message from a
3 non-collaborative client, the request containing information identifying the non-
4 collaborative client and the apparatus comprising:

5 a server connected to the non-collaborative client, including means for
6 receiving the request message, means for extracting from the request message
7 the information identifying the non-collaborative client and means for modifying
8 the request message by replacing the information identifying the non-
9 collaborative client with information identifying a queue in the server;

10 a first communication mechanism for sending the modified request
11 message to a collaborative client in the collaborative computer system via the
12 network, wherein the collaborative client provides a response message
13 containing the data and services requested;

14 a second communication mechanism for sending the response message
15 to the server queue identified in the modified request message, and

16 a contact mechanism responsive to the information in the server
17 identifying the non-collaborative client for forwarding the response message from
18 the server queue to the non-collaborative client.

- 1 13. The apparatus of claim 12 further comprising means operable by the
2 collaborative client for publishing a convenient name associated with selected
3 data and services available in the collaborative computer system before the non-
4 collaborative client generates the request message.
- 1 14. The apparatus of claim 13 wherein the request message includes the convenient
2 name and wherein the receiving means in the server comprises a mechanism for
3 extracting from the request message the convenient name and a name service
4 that is responsive to the convenient name for retrieving information identifying the
5 location of the collaborative client that can provide the selected data and
6 services.
- 1 15. The apparatus of claim 12 wherein the first communication mechanism
2 comprises:
3 means for sending the modified request message directly to the
4 collaborative client when the collaborative client is connected to the network; and
5 means for sending the modified request message to a relay server when
6 the collaborative client is not connected to the network.
- 1 16. The apparatus of claim 15 wherein the server is part of the relay server that
2 connects the non-collaborative client to the network.
- 1 17. The apparatus of claim 12 wherein the server waits on the server queue after the
2 first communication mechanism sends the request message to the collaborative
3 client and wherein the contact mechanism comprises means for forwarding the
4 response message from the server queue to the non-collaborative client when
5 the response message is received in the server queue.

- 1 18. The apparatus of claim 12 wherein the server does not wait for a response in
2 after the first communication mechanism sends the request message to the
3 collaborative client and wherein the contact mechanism sends forwarding the
4 response message from the server queue to the non-collaborative client in
5 response to a method call by the non-collaborative client.
- 1 19. The apparatus of claim 18 wherein the request message contains a unique
2 request identifier and wherein the response message returns the unique request
3 identifier to the non-collaborative client and the non-collaborative client
4 comprises a comparator that compares the request identifier sent in the request
5 message with the request identifier in the response message to determine if the
6 response is associated with the request.
- 1 20. The apparatus of claim 12 further comprising:
2 a subscription service responsive to a request from the non-collaborative
3 client for subscribing to an event service at the collaborative client indicating a
4 request for notification of selected actions in the collaborative system; and
5 an event mechanism in the collaborative client that places event
6 messages in the server queue when a selected action occurs.
- 1 21. The apparatus of claim 12 wherein the request and the response messages have
2 the same protocol.
- 1 22. The method of claim 21 wherein the protocol is the Simple Object Access
2 Protocol.
- 1 23. A computer program product for providing access over a network to data and
2 services available within a collaborative computer system in response to a
3 request message from a non-collaborative client, the request containing

4 information identifying the non-collaborative client and the computer program
5 product comprising a computer usable medium having computer readable
6 program code thereon, including:

7 program code for receiving the request message in a server connected to
8 the non-collaborative client, extracting from the request message the information
9 identifying the non-collaborative client and modifying the request message by
10 replacing the information identifying the non-collaborative client with information
11 identifying a queue in the server;

12 program code for sending the modified request message to a collaborative
13 client in the collaborative computer system via the network, wherein the
14 collaborative client provides a response message containing the data and
15 services requested;

16 program code for sending the response message to the server queue
17 identified in the modified request message, and

18 program code for using the information in the server identifying the non-
19 collaborative client to forward the response message from the server queue to
20 the non-collaborative client.

1 24. A computer data signal embodied in a carrier wave for providing access over a
2 network to data and services available within a collaborative computer system in
3 response to a request message from a non-collaborative client, the request
4 containing information identifying the non-collaborative client and the computer
5 data signal comprising:

6 program code for receiving the request message in a server connected to
7 the non-collaborative client, extracting from the request message the information
8 identifying the non-collaborative client and modifying the request message by
9 replacing the information identifying the non-collaborative client with information
10 identifying a queue in the server;

11 program code for sending the modified request message to a collaborative
12 client in the collaborative computer system via the network, wherein the
13 collaborative client provides a response message containing the data and
14 services requested;
15 program code for sending the response message to the server queue
16 identified in the modified request message, and
17 program code for using the information in the server identifying the non-
18 collaborative client to forward the response message from the server queue to
19 the non-collaborative client.